

Upright Vacuum Cleaner

Background of the Invention

5 The present invention relates to upright vacuum cleaners. More particularly, although not exclusively, the invention relates to an upright vacuum cleaner having a cyclone separation chamber, a dust receiving chamber and a suction fan all mounted co-linearly.

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Upright cyclone vacuum cleaners are known. These comprise a cyclone chamber and a fan drawing air through the cyclone chamber from an inlet nozzle. Such vacuum cleaners are bulky in design and cumbersome in use.

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Objects of the Invention

It is an object of the present invention to overcome or substantially ameliorate the above disadvantage and/or  
20 more generally to provide improved upright cyclone vacuum cleaner having a slim profile.

Disclosure of the Invention

25 There is disclosed herein an upright vacuum cleaner comprising:

an upper casing housing an electric motor having an output shaft and a suction fan mounted upon the output

shaft,

a cylindrical cyclone chamber situated beneath the suction fan and having an inlet port, a longitudinal axis of the cyclone chamber being co-linear with the output  
5 shaft,

a cylindrical dust receptacle situated beneath the cyclone chamber, a longitudinal axis of the dust receptacle being co-linear with the output shaft,

a funnel delimiting the cyclone chamber from the dust  
10 receptacle, and

a pickup head situated beneath the dust receptacle and communicating with the inlet port via a duct.

Preferably, the pickup head has a rotary brush therein  
15 caused to rotate my airflow induced by the suction fan.

Preferably, the cyclone chamber includes an upper tube having a frusto-conical inlet opening.

20 Preferably, the vacuum cleaner further the comprises a pan attached to the dust receptacle.

#### Brief Description of the Drawings

25 A preferred form of the present invention will now be described by way of example with reference to the accompanying drawings, wherein:

Fig. 1 is a schematic cross-sectional side elevation of an upright cyclone vacuum cleaner,

Fig. 2 is a schematic perspective illustration of the vacuum cleaner of Fig. 1,

Fig. 3 is a schematic parts-exploded perspective illustration of internal components of the vacuum cleaner of Figs. 1 and 2, and

Fig. 4 is a schematic parts-exploded perspective illustration of internal components of the pickup head of the upright vacuum cleaner.

#### 15 Description of the Preferred Embodiment

In the accompanying drawings there is depicted schematically an upright vacuum cleaner comprising at its bottom a vacuum pickup head 13 to be manoeuvred across a floor surface. The pickup head 13 comprises floor-engaging wheels 14 and a rotary brush 15 situated forward of the wheels 14.

Suspended above the pickup head 13 is an upper casing part 34 having an air outlet 37 via which clean air is exhausted. Depending from the upper casing part 34 is a cyclone chamber 2. Attached to or formed integrally with the cyclone chamber 2 is a dust receptacle 5 having a pan

6 attached thereto by hinge parts 16a and 16b at one side and catch parts 7 and 11 at the other side. There is an 0-ring 10 between the dust receptacle 5 and the pan 6. There is a handle 80 extending from the upper casing part 34 by which the vacuum cleaner can be manoeuvred in use.

Situated within the upper casing part 34 is an electric motor 38 having an output shaft on which there is mounted a fan 50. The longitudinal axis of the electric motor 38, its output shaft and the rotation axis of the fan 50 are co-linear with the substantially vertical longitudinal axis A of the cyclone chamber 2 and dust receptacle 5.

15 There is an ON/OFF switch 39 at the top of the upper casing part 34 and a power-indicating LED 43 alongside it.

Within the cyclone chamber 2 there is an upper tube 1 and an air inlet tract 3 beside it. A frusto-conical flange 4 depends from the bottom of the upper tube 1 and flares outwardly therefrom. Beneath the flange at the bottom of the cyclone chamber 2 there is a funnel 60 that converges inwardly in a downward direction en route to the dust 25 receptacle 5. There is an 0-ring 9 between the cyclone chamber 2 and dust receptacle 5.

The cyclone chamber 2 has a tangential inlet port 70 via

which air is drawn into the chamber to induce a swirling airflow about the upper tube 1. Attached to the inlet port 70 is an air duct 42 that extends over the top of the upper casing part 34. Duct 42 is an elongate hose through which air flows from the pickup head 13 to the inlet port 70 via the air channel 15.

- 10 There is an extendable post 41 extending upwardly from the pickup head 13 toward handle 80. The extendable post 41 is a telescopic handle. This can be adjusted to a set a height for different users.
- 15 As shown in Fig. 4 a rotating brush 22 extends laterally of the pickup head. The brush 22 is driven by a belt 21 that extends from an impeller 19. There are service caps 25 concealing the bearings 24 upon which the brush is mounted. Item 17 is an air diverter for diverting air from air channel 15 into the duct 42. The air channel 15 comprises a connector placed inside the pickup head 13. There is a plastics turning clip 16 that has a ring for locking the air channel 15 and an air coupler 18. The air coupler 18 guides the air via an air part top 33 to the air channel 15 and provides a rotary function on movement. The air path top 44 comprises a cover on the pickup head 13 and guides the air from the brush 22 and covers the tyre 31, in a wheels 32, shaft 33 and wheel

cover 30.

In use, the switch 39 is depressed at which time LED 43 illuminates as motor 38 activates. The fan 50 rotates at high-speed to draw air upwardly through the upper tube 1 and thereby induce a vacuum in the cyclone chamber 2 and dust receptacle 5. The only air inlet to this chamber is inlet port 70 which induces a swirling action about the inlet tube 1 by virtue of its tangential disposition. Heavy dust particles will impinge upon the internal wall of the chamber 2 and fall down via funnel 60 to the dust receptacle 5. Suction induced in the cyclone chamber 22 is of course relayed to the pickup head 13 whereupon airflow induces rotation of the impeller 19 to thereby cause rotation of the brush 22 to gather dust from a floor surface.

It should be appreciated that modifications and alterations obvious to those skilled in the art are not to be considered as beyond the scope of the present invention. For example, the brush 15 might be provided with its own drive motor.